

**Amendments to the Claims:**

This listing of the claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. **(currently amended)** A method of traffic management in an optical network, comprising: ~~a step of measuring chirp of one or more optical signals passing along one or more optical channels in an optical path extending in said network, and a step of making a decision about performing traffic management operations, based on a result of the measurement,~~  
  
~~wherein the step of measuring chirp comprises measuring a second derivative of phase of at least one of said optical signals in at least one of said optical channels with respect to time~~  
  
detecting a condition of non-linearity in a network section corresponding to an optical path extending in said network by measuring chirp of an optical signal passing in the network section,  
  
comparing a value of the measured chirp with at least one chirp threshold value preliminarily known for said network section when being in its linear condition, and  
  
in case the condition of non-linearity is detected in said network section, making a traffic management decision in said optical network for restricting or avoiding use of said network section in the network.
2. **(currently amended)** The method of traffic management in the optical network according to Claim 1, wherein the optical path extends between a first location and a second

location being a monitoring point and comprises one or more optical channels carrying at least said optical signal ~~the optical signals~~, wherein the step of ~~measuring chirp~~ detecting non-linearity and the step of making a said traffic management decision respectively comprise:

measuring chirp at said at least one optical channel, at the monitoring point;

comparing a value of the measured chirp with said at least one threshold chirp value determined for said monitoring point in said section being in linear condition,

in response to the measured chirp and with reference to said at least one threshold chirp value, judging about a level of non-linearity in said at least one optical channel ~~of the optical path~~ up to the monitoring point, and

in case the non-linearity level is considered higher than a selected acceptable level,  
performing ~~said one or more~~ traffic management operations from the following non-exhaustive list: ~~to reduce said non-linearity level~~

reducing bit rate of at least one of said optical channels;

rerouting at least one of said optical channels;

reducing a number of optical channels in the optical path; and

transmitting information, previously carried at a specific wavelength, via a vacant optical channel of the same optical path at a different wavelength.

3. (cancelled)

4.       **(original)** The method according to claim 2, further comprising a step of repeating the method from the step of measuring the chirp, up to a moment when the non-linearity level is considered to be not higher than the selected acceptable level.

5.       **(cancelled)**

6.       **(currently amended)** The method according to Claim 2 ~~5~~, wherein said operation of rerouting of said at least one optical channel is performed by routing the optical signals of one or more of the optical channels for regeneration, and returning said signals back to said optical path.

7.       **(currently amended)** The method according to Claim 2 ~~5~~, wherein said operation of rerouting of said at least one optical channel is performed by routing one or more of the optical channels via a different optical path and returning thereof to the monitoring point via said different optical path.

8.       **(currently amended)** The method according to Claim 2 ~~5~~, wherein the operation of reducing the number of optical channels is performed by temporarily ceasing transmission of one or more of the optical channels via the optical path.

9. **(currently amended)** The method according to Claim 2, wherein said acceptable level of non-linearity is defined by ~~selecting at least one~~ the threshold chirp value determined for at least one said monitoring point, wherein said monitoring point is located at the output of a dispersion compensation module DCM utilized in the optical path.

10. **(currently amended)** The method according to Claim 2, wherein said acceptable level of non-linearity is defined for a particular optical signal transmitted in a particular optical channel, by selecting a ~~an~~ additional threshold BER (bit error rate) value being a maximally acceptable BER value for said specific optical channel, the method thereby allowing detection of an approaching non-linearity condition.

11. **(currently amended)** The method according to Claim 2, wherein said acceptable level of non-linearity is defined by selecting a range between a lower bound and an upper bound, where the lower bound is presented by ~~an absolute~~ said threshold chirp value calculated for the optical path in its linear condition, and the upper bound is presented by an additional threshold chirp value corresponding to a maximally acceptable value of BER (bit error rate) for a particular optical signal transmitted in a particular optical channel of the optical path, the method thereby allowing detection of an approaching non-linearity condition.

12. **(original)** The method according to Claim 11, wherein the traffic management operations are performed gradually, some of them upon exceeding the lower bound and some of them upon exceeding the upper bound of said range.

13. **(currently amended)** The method according to Claim 2, further comprising ~~performing at least one preliminary operation selected from the following non-exhaustive list:~~

preliminarily calculating chirp for a linear condition of said optical path for at least one of said optical channels, and obtaining said at least one ~~absolute~~ threshold chirp value based on said calculations; and

performing at least one preliminary operation selected from the following non-exhaustive list:

building a number of curves for at least one of said optical channels, wherein each curve reflects dependence between a real chirp and BER at a particular bit rate of optical transmission; and selecting at least one threshold BER value for the number of said bit rates; and

performing numerical calculations of a real chirp for at least one of said optical channels of the optical path being in a non-linear condition; and selecting at least one non-linear chirp threshold ~~chirp~~ value based on said calculations.

14. **(previously amended)** The method according to Claim 1, wherein said step of measuring chirp measures chirp of one or more optical signals passing along at least two of said one or more optical channels of the optical path.

15. **(original)** The method according to Claim 1, comprising performing thereof at a plurality of monitoring points in the optical network, thereby ensuring monitoring of non-linearity effects at sections of the network formed between the monitoring points, and performing various traffic management operations for reducing the non-linearity effects at suitable sections of the network.

16. **(currently amended)** A system ~~capable of performing the method~~ for traffic management in an optical network ~~according to the method of Claim 1~~, the system comprising:  
  
at least one optical path extending in said network ~~at least one nodes; and~~  
  
at least one measuring unit for measuring chirp of an optical signal passing in a network section corresponding to said optical path, and for communicating a value of the measured chirp;  
  
and  
  
a central traffic management unit for receiving the communicated value of the measured chirp, comparing it with at least one chirp threshold value preliminarily known for said network section when being in its linear condition, detecting a condition of non-linearity in the network section when the value of the measured chirp exceeds said at least one chirp threshold value, and then making a traffic management decision in the optical network for restricting or avoiding use of said network section in the network.

17. **(currently amended)** The system according to Claim 16 ~~method according to claim 1~~, wherein the optical path comprises one or more optical channels carrying at least said

optical signal, and wherein the central traffic management unit is further capable of initiating  
~~operations include~~ one or more operations selected from the following non-exhaustive list:

reducing bit rate of at least one of said optical channels;

rerouting at least one of said optical channels;

reducing a number of optical channels in the optical path; and

transmitting information, previously carried at a specified wavelength, via a vacant  
optical channel of the same optical path at a different wavelength.

18.     **(New)** The method according to claim 1, wherein the step of measuring chirp  
comprises measuring a second derivative of phase of said optical signal with respect to time.